


Hands-On: Getting Data from NRCS (and some styling tasks)

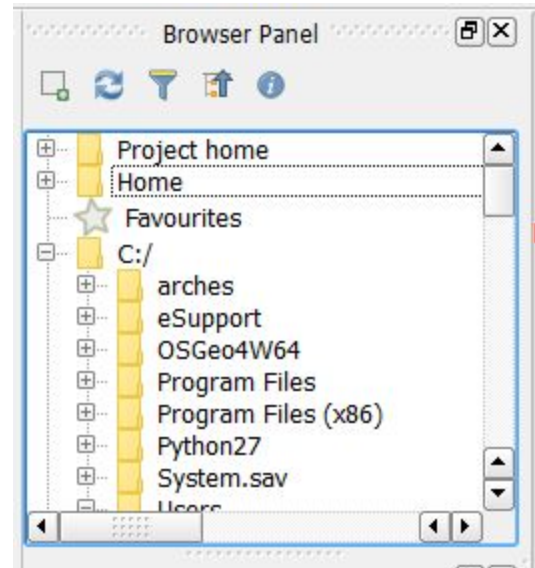
— Task 1: Downloading Data From NRCS GeoSpatial Data Gateway

1. Go to <https://gdg.sc.egov.usda.gov/>
2. Use the "I Want To..." panel on the right side, and choose "Order by County/Counties"
3. Select desired State (WI) and county (Vernon, and/or La Crosse, Crawford, etc.)
4. Look at all the datasets!!
 - a. NRCS aggregates data from many different sources, which is why this geospatial data gateway is great
 - b. It's useful to spend time clicking on the blue "i" icons to read about each dataset
 - c. With QGIS, all of this information can be overlaid, combined, or analyzed
5. Scroll down to the "Hydrologic Units" section, and check the boxes for the 8, 10, and 12 digit Watershed Boundary Datasets, click "CONTINUE" at the bottom of the page
6. Complete the How page
 - a. Format, select Shapefiles
 - b. Projection, select WI State Plane South
 - We will use a projected CRS because it allows us to accurately calculate the area of these polygons
 - c. Delivery, always choose Download, because it's free!
7. After continuing, enter your email and mailing address
 - a. There is no FAQ answer for why you need to enter a mailing address, but I assume it is to generate usage statistics, ultimately to justify program funding
8. Once you have continued and placed your order, take a breather and check your e-mail in a minute
 - a. The larger the order (judged by file size), the longer it will take to be processed on the NRCS servers
 - b. It may take a few minutes, but I've never had an order not show up
9. You will receive an e-mail from "Geospatial Data Gateway" that contains one or more links to a zip file. Just click the link to begin downloading.
 - a. You'll see a section of the e-mail called "Ordered Items", and the download links are in there

— Task 2: Importing Data From NRCS Download

1. Go to your Downloads folder, and find the freshly downloaded .zip file
 - a. Our watershed boundary files will be called "hydrologic_unit..."
2. Move these zip files to your preferred data directory, and unzip each one
 - a. If you are prompted to replace a file, say yes
 - b. The result should be a new directory called "hydrologic units", which contains 3 shapefiles
 - c. It's good practice to keep the original .zip files, in case you mess up one of the unzipped files

3. Open your QGIS project, and make sure you are zoomed to the Vernon County Bounds layer
 - a. Turn off all other layers
4. There are a few ways to add data to your project, we'll try out the two easiest methods
5. In the toolbar on the left, click the "Add Vector Layer" button: 
 - a. As polygons, watersheds are vector features
 - b. Select the "File" source type, and click "Browse"
 - c. Navigate to the directory where you have stored your shapefiles, and be sure to select the file that ends with ".shp"
 - d. You may be prompted to select the correct CRS. Remember, we choose WI State Plane South, and be sure to use the one whose units are meters
6. After adding one set of watershed boundaries let's add another set, this time using the Browser Panel
 - a. If you don't have the Browser Panel visible, go to *View > Panels* to enable it.
7. Use the panel to navigate to your data directory
 - a. You'll notice that here, a shapefile is only show as one entry, not its constituent parts
8. To add any dataset to your project, just drag it into your map view
9. **IMPORTANT FINAL STEP!!** You'll find that the 10 digit watershed layer (named *wbdhu10_a_wi123*) does not look right. This is because it seems to ship from NRCS with a slightly wrong CRS.
 - a. Right-click on the layer and select "Set Layer CRS"
 - b. Type "102354" into the filter, and select the projected CRS called "NAD_1983_HARN_StatePlane_Wisconsin_South_FIPS_4803"
 - c. (The problem is that the data originally comes with a WI StatePlane South CRS in feet, not meters. You'll notice that when it's corrected, the polygons increase in size about threefold.)
 - d. Ultimately, all three watershed layers should be right on top of each other.



— Task 3: Style the Watershed Boundary Layers (Vector Layers)

1. Make a group layer in your Layers Panel from the three watershed layers
 - Hold ctrl and select each layer, then right-click on one and select "Group Selected"
2. Re-order the watersheds so that the larger polygons are below the smaller ones, like so:
 - HUC 12 (top)
 - HUC 10
 - HUC 8 (bottom)

3. To change the style of a layer, you must open its properties
 - Either double-click the layer in the Layers Panel, or right-click and go to Properties
4. Go to the Style tab
5. Select the “Simple fill” symbol to make changes
 - We will be changing the Border Color, Fill Style, and Border Width for each of the watershed layers.
 - i. **wbdhu12_a_wi123**
 - Border Color: black (#000000)
 - Fill Style: no brush
 - Border Width: .26 mm
 - ii. **wbdhu10_a_wi123**
 - Border Color: dark grey (#383838)
 - Fill Style: no brush
 - Border Width: 1.1mm
 - iii. **wbdhu8_a_wi123**
 - Border Color: bright yellow (ffff00)
 - Fill Style: no brush
 - Border Width: 2mm

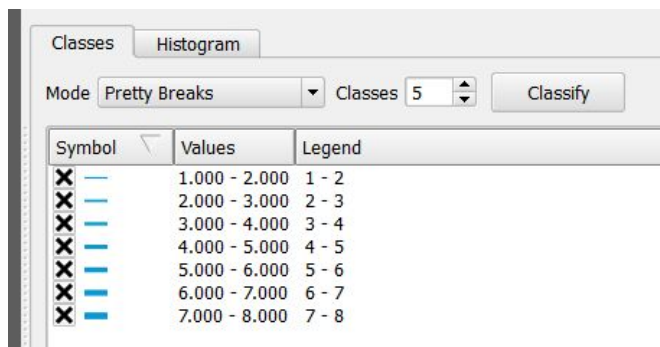
— Task 4: Style the Vernon_County_DEM Layer (Raster Layer)

1. Turn on the Vernon_County_DEM layer in the Layers Panel
2. Open the layer Properties (see step 3 above for help), and go to the Style tab
3. In the “Generate new color map” section, use the dropdown to select the color ramp named “Greens”
4. Check the “Invert” box, and click “Classify”
 - a. You’ll see all of the rasters elevation values split into classes, with a shade of green attached to each class.
5. Click “Apply” at the bottom of the window, to update your map.
 - a. This is really fun. QGIS makes it very easy to work with and customize color ramps.

— Task 5: Download and Style VC Hydrology Layers


1. Download this file:
http://legiongis.com/safe/introgis/day3/WD_HYDRO_vcHUC12_clip.zip and unzip to your preferred data directory
2. Add the two shapefiles to your project, using either method described above
 - a. In the Layers Panel, adjust these new layers to be on top of the elevation and aerial imagery, but underneath the watershed boundaries.
3. Open the properties for the polygon layer
 - a. In the Style tab, select the Simple Fill symbol
 - Fill Color: blue (#0a99d6 looks nice)
 - Border Style: No Pen

4. Open the properties for the line layer
 - a. In Style tab, select “Graduated”. This will allow us to make a graduated style based on the values in one of the Attribute Table columns.
 - b. Make the following changes
 - Column: STREAM_ORD
 - Symbol: Click “Change...” to use the same blue as above
 - Precision: 1
 - Method: Size
 - Size from: .25
 - Size to: 1.0
 - c. Under “Classes”, change the mode to “Pretty Breaks”, and click Classify. You’ll get something like this:



- d. Click “OK”

— Task 6: Create a Point Using a Delimited Text Layer, and Save to New Shapefile

1. Open the “GIS_Packet” folder from Day 1
2. Right click in the folder view; a popup menu will appear
3. From the menu, choose *New > Text Document*
4. Name the document “my house.txt”
5. Open the text file and enter the following (no spaces), replacing the coordinates with your own:
latitude,longitude
43.555266,-90.873413
6. Save and close.
7. In QGIS, go to the Layers Toolbar and click “Add Delimited Text Layer”: 
8. QGIS should automatically recognize the file structure & load the correct settings
9. Once you press “OK”, you will be prompted to choose a CRS
 - a. Enter “4326” in the search field, select **WGS 84** from the list & press “OK”
10. A new layer titled “my house” will appear in the Layers Panel
11. Right-click on the layer, and choose “Save As...”
12. Select ESRI Shapefile as the Format, and click “Browse” to save to your preferred data directory
13. Make sure the CRS is WSG84 and click “OK”